

Hobbies

WEEKLY

November 10th, 1943

Price Twopence

Vol. 97. No. 2508

The new 5.5 gun can be made as a working MODEL HOWITZER

WE feel sure that this working model gun will find favour with our model makers. The actual gun from which the outline of this model was taken, forms one of Britain's 5.5 Gun-Howitzers which gave the enemy a great surprise in the Tunisian campaign.

Our model is 15ins. long, and the barrel and breech mechanism carried on a wide carriage having substantial wheels shaped and painted to represent the huge rubber-tyred wheels of the actual gun.

Elastic Power

A 3/16in. diameter "shell" is thrown by means of a plunger rod which is fastened to the breech-block. This breech-block is connected to the barrel each side by rubber bands fastened to screw eyes, and this

method gives surprising firing power.

The gun barrel is mounted in trunnions on the carriage so its elevation or line of fire can be controlled at will. Almost useful side view of the gun is given, with scale drawn underneath so certain parts can be scaled off direct if desired.

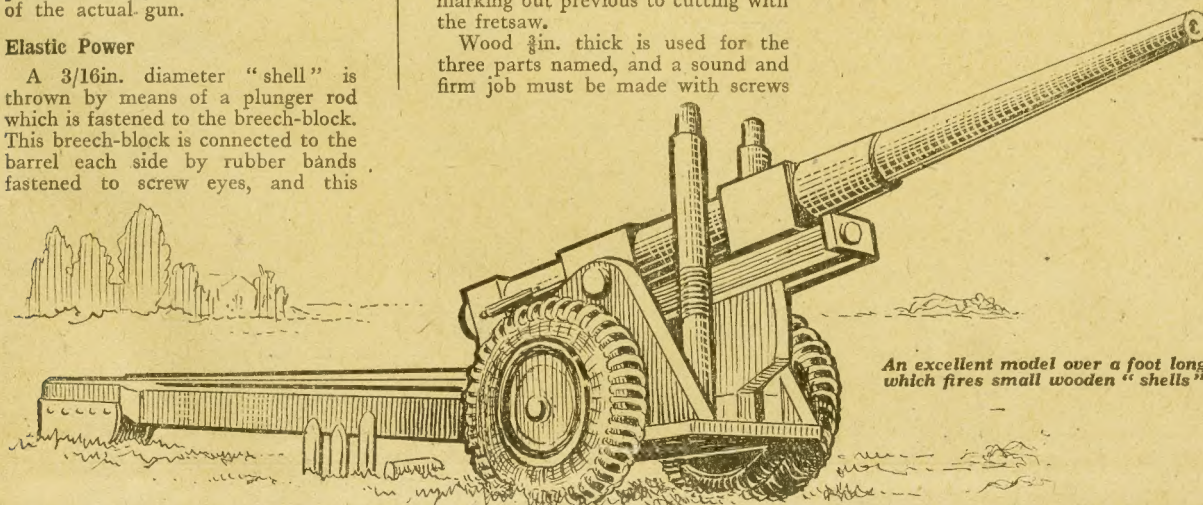
This diagram too, shows clearly the position of nearly all the parts. The trunnions A, and their base, B, should first be taken in hand, and at Fig. 1 this part is seen in detail with all necessary measurements given for marking out previous to cutting with the fretsaw.

Wood 3/4in. thick is used for the three parts named, and a sound and firm job must be made with screws

added where practicable to reinforce the glue. Cut the slotted holes in the trunnions as shown for the passage of the main axle which holds the wheels. This axle is of 1/4in. diam. rod.

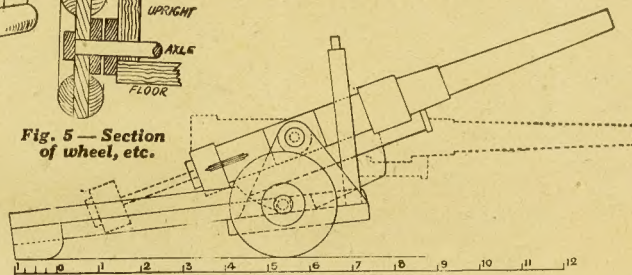
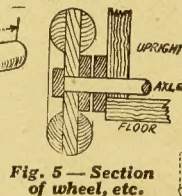
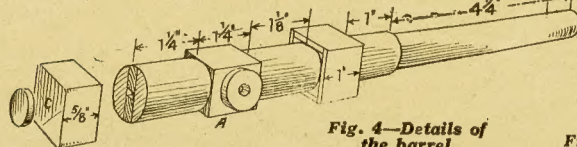
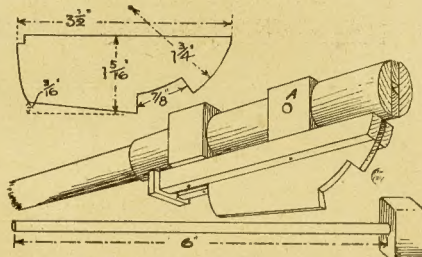
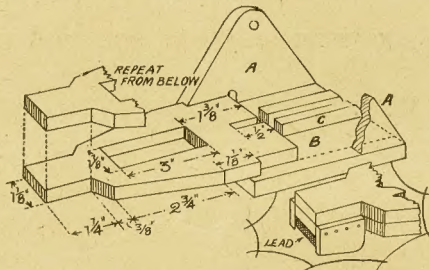
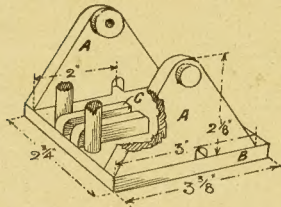
Two blocks, C, are glued to the base as shown, 3/16in. apart, the blocks being length 1 1/2ins. and width and thickness 3/4in. Note that these blocks are fixed with their rounded edges flush with front edge of the floor A.

The holes at the top of the trunnions which take the pivoting pins on the gun barrel are 1/4in. diam., and two



An excellent model over a foot long which fires small wooden "shells"

At the extreme far end of the trail two "spade" pieces are glued and screwed on as shown in Fig. 1 and again in Fig. 2 in the attached diagram.



The shaping of the barrel can be seen in the detail Fig. 3, and there are two sections of it which must be left

The breech-block which takes the plunger rod (Fig. 4) is a solid piece 1½ ins. square and ½ in. thick. Its centre has a 3/16 in. hole and is made to take the 3/16 in. diam. rod. After the rod is glued in the block a ½ in. disc is glued on the end, (Fig. 3.) and in the side view of the gun.

The whole gun with trunnions and trailer complete is mounted on strong built-up wheels fixed to a $\frac{1}{4}$ in. diam. axle. To represent the tyres on the wheels two rings are glued on each side of the central disc which forms the main wheel. In the section of the

A 3/16in. thick washer 3/4in. in diameter and having a 3/16in. hole in its centre is glued on at each side

All the woodwork should receive a rubbing with fine glasspaper and the whole gun painted grey, with certain parts perhaps painted black to get relief. The centre parts of the wheels should be black with the outer tyre portion of a paler grey than the rest of the work.

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For Games, Puzzles, Stands, Door Plates, etc., you find THE USES OF A FRETSAW

MANY readers, particularly those who have only recently become followers of our pages, look on the fretsaw merely as a tool with which to complete the designs published every other week with these issues. A little thought, however, should show them that it is an excellent tool for a lot more than this, and can be used on numerous occasions.

Whilst the pattern sheet given with these issues is an excellent form of recreation, there are periodical times when the reader would like a change, or has a little odd time to spare when the making of something big is not demanded.

Many Uses

A little thought in this direction will prove to the worker how he can use the fretsaw in different ways, and a few suggestions on the subject may provide him with further ideas.

Not that these are intended to be conclusive or entire, because as we know from experience, our readers have an ingenious and happy knack of thinking things out for themselves and undertaking new methods, new jobs, and new ways of using hand and brain and material to good result.

Checkers or Chessmen

As a simple instance, have you ever thought of the fretsaw as a cutting out implement for normal games such as are enjoyed during the winter months? Circular checkers for the game of draughts incidentally arise to mind, and several times in these pages we have provided the outlines for chessmen.

These are cut to the normal shape of the "men" and then made to stand by gluing them on to small circular bases or fixing them by means of a mortise and tenon joint. The latter method, by the way, is preferable because the constant handling of the chessmen is apt to get the bases knocked off unless they are fastened right on with the joint mentioned.

Question of Drawing

Some readers may say they are unable to mark out nicely the outline of the men, or even to undertake drawing of any kind with success. This, however, should not prevent them going on with the work because they must surely know someone amongst their friends who would be able and pleased to undertake it for them. There is an art master at most schools, there is an artist or draughtsman in most works, there are a number of people who make a hobby of drawing.

All these would, we know, be pleased to rough you out the outlines for chessmen, or indeed, any other similar drawing which you might be likely to require.

Stand Up Pictures

In these pages, too, we have frequently had suggestions for cutting out photographs or figures as statuettes. This can be carried a step further by making stand-up animals for kiddies. Suitable design sheets are obtainable, giving the necessary outline. The shape is either drawn on to the wood or the actual paper pasted down, and then the fretsaw used to cut it out. If you are able to undertake the cutting in thick wood, so much the better, because then the animals will actually stand of their own thickness.

If, however, thin wood is used, the animals can be supported on a narrow flat base sufficiently thick to provide

a heavy foundation. The photographs, of course, are cut out from wood and made to stand in a similar way, or can be added to a backboard in any of the several methods suggested in these pages recently.

Jigsaw Puzzles

Then, of course, there is always the question of jigsaw puzzles which can easily be cut if you can find a piece of plywood suitable for them. Pictures taken from old magazines are quite suitable. We would recommend the use of plywood in this instance, because the narrow necks and linking pieces if cut in ordinary wood are apt to get broken.

Two or three ways of cutting a jigsaw puzzle are shown in the 1944 Hobbies Handbook which is now on sale. The pencil marking of the jigsaw puzzle is made on the picture itself, and then the fretsaw used to cut out the various parts. One

Bits of tree and a base make a NOVEL SPILL HOLDER

THE illustration herewith is of an interesting Spill Holder which was made by one of our readers, and should appeal very strongly to others for its simplicity, attractiveness and novelty. The original was made by J. Dewar of Ashley Terrace, Alloa, Scotland, and the drawings should explain themselves.

The odd pieces of bark and wood are easily obtainable, and equally easily cut with a fretsaw, and finished with penknife and glue. The base is a circle of $\frac{1}{4}$ in. wood with a radius of 2 ins., whilst the actual Spill Holder is the hollowed portion of a tree branch.

Suitable Wood

If you can get willow or some similar wood, so much the better, as the centre of this can be hollowed out much more easily with a hot poker. The inside must, of course, be rounded smoothly with glasspaper on a stick so the spills will slide in and out without catching.

The ornamental canoe is easily cut from a piece of $\frac{1}{4}$ in. wood and small pieces of twig and incidental wood can be used to form the "bank" and surrounding portion. The part under

the canoe is painted blue, the edge of the base black, and the rest can be varnished for the sake of preserving as well as a better appearance.

There is no doubt such a little article as this will appeal and proof of it is provided by the letter accompanying the sketch sent by our reader-friend. He made eight himself and gave them as gifts to his friends, whilst for a Red Cross effort they were sold at 10s. each. No doubt the suggestion will appeal to many others in like manner.



advantage, of course, is that in making your own, you can cut them as simple or as intricate as you wish.

Simple Jigsaws

The normal jigsaw, of course, is an interlocking piece where all parts hang together by a neck projecting piece. If you do not feel able to undertake this, there is no reason why the lines of the jigsaw should not be square or gradually curved. They will still form as interesting a puzzle to solve.

If you have some small odd pieces of wood, think over the question of turning them into simple table mats for hot water jugs or teapots. Many of the designs published with *Hobbies Weekly* have had suitable patterns for these. They may not have been intended for that purpose, but with a little thought you can extract them from their original suggestion and utilise them for the need in hand.

Teapot Stand Design

For instance, a teapot stand is usually circular. Many overlays or portions of a design contain a circular portion of pattern, and this can be used for the purpose. If you cannot find a circular one amongst your back numbers, then bear in mind the question of making one square or octagonal. This may fit some of the parts of the patterns which you have,

and it can in this way be included in your new work.

Then what about finger plates for doors? Most of us know the gradual wearing of the paint on the panel of a door just above the handle. This wearing is caused by frequent opening and closing with the fingers below the door, instead of using the handle.

Door Plates

This unsightly patch can be covered or even prevented in the first instance by a small finger plate cut from thin wood to a fancy shape. It need only be about 3ins. wide and is cut with fancy ends. A nicely grained board should be used.

Make it look nice by staining it a little darker, and then add a coat of varnish or polish for a smooth glossy surface. If you have any store of colour transfers, why not put them on these finger plates? Just add a little circle, a diamond, or fancy shell pattern will provide colour and attractiveness to an otherwise plain surface. When you have put these on, remember to varnish over them, otherwise the surface may become scratched and the colour pulled off.

In normal times, too, at this season of the year, the fretsaw would be very largely used for cutting out calendar pictures, but the whole question of that, now revolves on whether you can obtain the calendar pads for 1944.

If so, utilise the fretsaw with them in making a suitable gift for Christmas and one which will prove its utility during the next year. Here again the picture is cut out and can be amusing, interesting, or quaint. Colour pictures are best, but not essential, and they should have a suitable background which will leave a clean outline to be cut with the fretsaw.

Calendar Pictures

An aeroplane in flight is also a happy thought in this connection. Paste the picture on the wood and cut it out, then hang the little calendar pad by means of two fancy ribbons below the plane. If you are using pictures for stand purposes, a space must be allowed or allotted for the calendar pad itself, according to its size.

To Stand or Hang

If you are wanting the whole thing to stand, a suitable long narrow base is glued or fixed on. Methods of doing this have been shown at various times in these pages. On the other hand, the calendar and its picture can be hung by means of a piece of fancy ribbon or coloured cord strung through as a loop at the top.

The principal point, of course, is to make sure of your date pads before you start. There will not be many about, so if you see any, buy them at once, don't wait until Christmas is here.

BOMB RELEASE DEVICES

THESE hints are intended principally to aid the solid model aircraft maker who likes to have a model bomber that really does drop bombs. First of all, in Fig. 1., we have a useful method for releasing bombs carried beneath aircraft wings and fuselages in external racks. These are suitable for model Hurricanes, Spitfires, Kittyhawks, Typhoons F.W.190's, etc., when adapted as fighter bombers.

The wooden bomb has two small wire loops at each end which are glued

into holes drilled into the wood. Another length of wire is glued into the underside of the wing or fuselage centre section, then bent at right-angles as indicated. The plane goes into a slight dive and the bomb slides off the wire and is released.

For Dive Bombers

The second satisfactory idea is designed for dive-bombers, like the Vengeance, Dauntless, Devastator and similar aircraft which carry their bomb load internally.

A length of fuselage is hollowed out on the underside and a short piece of tin-plate or 1mm. thick ply-wood is glued as shown in Fig. 2, to allow the bomb to rest on when the aircraft is horizontal. An open space is left in front of the "rack" and as the aeroplane dives the bomb is dropped.

Fig. 3 illustrates a further simple method for launching an externally carried torpedo, as used on the adapted Beaufighters, Swordfish, Shark and others. Small wire loops are glued into the upper side of the torpedo and two pieces of wire bent at right-

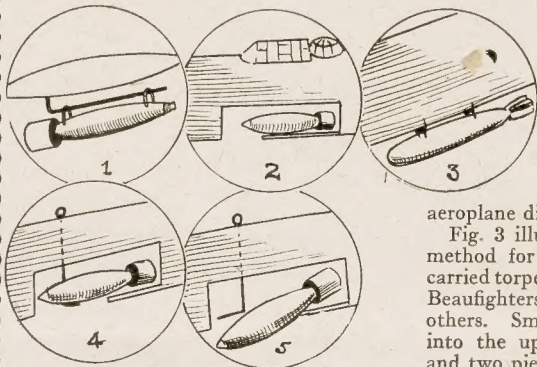
angles are glued into the underside of the fuselage. Only a very moderate diving angle is required to launch the "tin-fish".

Flying Release

Finally, we have a very effective method for releasing bombs while flying level; ideal for precision bomber models like the Stirling, Halifax, Lancaster and other "heavies." The fuselage is hollowed out on the underside and a small strip of tin-plate, or 1mm thick ply-wood, is glued in the position indicated to support the tail of the bomb.

A length of thin wire is then passed through a hole drilled in the starboard side of the fuselage top, and twisted on top to form a small wire knob, with its end passing down into the fuselage and bent at right-angles beneath the nose of the bomb, as clearly shown in Fig. 4.

As will be seen, when the wire knob is twisted the bomb's nose is released and the bomb ejected as in Fig. 5. It is very simple to fit as many as three or four of these racks in a single four-engined heavy bomber with each rack capable of holding up to four bombs.



A pocket battery and some wood make a novel ELECTRIC CANDLE

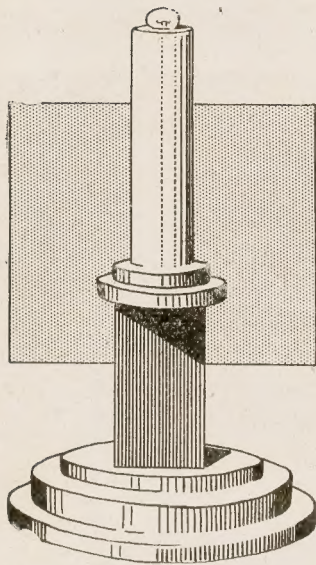


Fig. 1—Twist the bulb to light the candle

NOW that No. 8 torch batteries are more plentiful again, including other makes of the same size and voltage, readers might care to construct the "safe" electric candle light illustrated on this page. It is a novelty particularly suitable for the nursery or one's own bedroom, in fact.

A twist of the bulb turns the light on or off. This does away with a switch which, in the case of this novelty, would look out of place and would anyhow, be a rather troublesome thing to connect up.

The whole novelty is completed in wood, using scrap material and a few odds and ends. It is finished in jade green and white enamel paint, the "candle" part, of course, being the only feature painted white so as to give it a realistic appearance. The construction is simple and interesting, whilst the finished result is pleasing and a bit of a mystery to those who search in vain for a switch; so, it is a "secret" light, too, you see!

Base Construction

The base of the structure should be made up first. Details are provided at Fig. 3. Parts B and C are not shown, however, as these are merely plain discs of wood.

Cut out the battery housing pieces first, two of D being required. The other two pieces are $2\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide; all four pieces, i.e., the sides (D) and the ends, are cut from $\frac{3}{16}$ in. wood and glued and nailed together to form a square tube.

The top pieces, E and F, are also

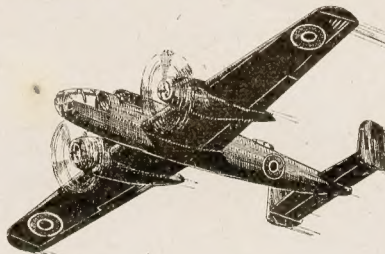
cut from $\frac{3}{16}$ in. stuff. Part E is glued to the top of the tubing, then part F fixed on top, in the centre. The top base piece, C, is cut from $\frac{3}{16}$ in. wood exactly as shown at Fig. 3. The shaping seen in the centre is merely a $\frac{1}{4}$ in. square hole slotted at each side to take the tenons on the battery tube.

The Other Base Parts

Having affixed part C to the tube, parts B and A are prepared, the former being a disc of $\frac{3}{8}$ in. wood $3\frac{1}{2}$ ins. in diam., with a $\frac{1}{2}$ in. hole cut in its centre, whereas the latter is a $4\frac{1}{2}$ ins. diam. disc cut from $\frac{3}{16}$ in. wood, the hole in the centre being $1\frac{1}{2}$ ins. in diam. Disc B is attached beneath disc C and centred, following

Design for Model Mitchell Bomber

This week's free Design (No. 2508) is for a non-flying model of the Mitchell Bomber. Complete parcels of wood for all parts are obtainable from Hobbies Branches for 1/6 or by post from Hobbies Ltd., Dereham, Norfolk, for 2/1.



which disc A is affixed centrally to disc B, as can be seen in the sectional view at Fig. 3.

The assembly of the discs must be done neatly and truly, as the central hole is a nett size for the torch batteries. Moreover, be sure to have the edges and surfaces of the parts smoothly glasspapered. The edges of the top disc E could be rounded over, if desired.

Making the Candle

The "candle" can now be proceeded with, it being made from a $3\frac{1}{2}$ ins. length of $\frac{1}{2}$ in. dowelling. However, it would be a simple task to round a piece of $\frac{1}{2}$ in. square wood with a small block plane or smoothing plane.

When cut to length, centre each end, then drill a $\frac{1}{8}$ in. (or $1/16$ in.) hole through the dowelling, working from each end. This means careful gauging with the eye alone while turning the brace or hand-drill.

A socket hole for the flashlamp

bulb is then bored with a $\frac{1}{8}$ in. twist bit to a depth of $\frac{1}{2}$ in., as shown in the sectional side view. The hole running right through the dowel is, as you may have realized, for a wire. As it is impossible to drill another hole through the dowel for a second wire, the only practical thing to do is to make a groove for it down one side of the dowel.

The groove is best made by cutting along the length of the dowel with a tenon saw to a depth of $\frac{1}{8}$ in. The dotted lines indicate the wires. Any fine wire, such as a strand from a piece of aerial wire, for instance, may be used.

Wiring the Candle

To wire the candle part, insert a length of wire through the centre until it projects about $\frac{1}{2}$ in. at the top. A $\frac{1}{8}$ in. by $\frac{1}{16}$ in. roundhead screw is then driven into the hole so its threads "bite" into the wire and make a good connection.

The opposite end is treated in the same way by cutting the wire so it projects $\frac{1}{2}$ in. and then the screw driven in. Regarding the other wire, it is best connected by drilling a small hole into the groove about $\frac{1}{8}$ in. from the top of the dowel.

Insert the wire into this hole, then drive in a $\frac{1}{8}$ in. by $\frac{1}{16}$ in. flathead screw. The head of the screw will counter-sink a way for itself, but if not, on account of the hardness of the wood, it will have to be done with a counter-sink bit.

The side wire must stretch from the screw down to the battery clip, so do not connect a wire less than 9 ins. long. The bottom end of the candle, as you can see, fits into the circular recess formed by disc F.

Now, in order to attach the candle,

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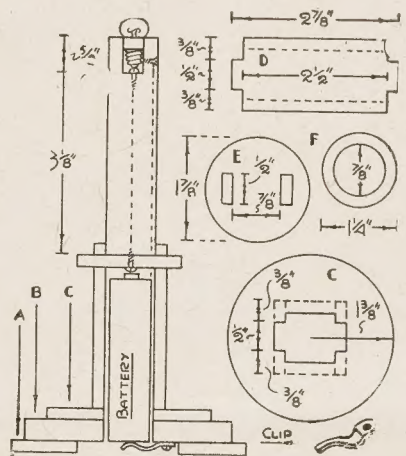


Fig. 2—Sectional side elevation

Fig. 3—Base part details

Handymen should remember these HINTS ON GLAZING

HAVING pressed a new pane of glass in its bed of putty in the rebate of a window frame, the next procedure is to nail the glass in position, then complete the glazing with more putty. It is while hammering the fixing nails that the glass is apt to be shattered by getting an accidental knock from the hammer. To prevent this, the hammer head should be held sideways against the glass and the nails driven into the woodwork by sliding the hammer up and down.

PUTTY is made up from linseed oil and whitening. While, therefore, linseed oil is the solvent, it does not have to be the only oil to use in order to soften putty that has become somewhat dry and hardened. Other oils can be used, such as machine oil, bicycle oil—even hair oil, in fact!

WINDOW panes fitted in out-houses, sheds, etc., with only slips of wood to keep them in their frames is good enough—provided the windows are “sheltered” from the rain by their depth in the face of the structures. If the windows are almost flush with the buildings in which they are fitted, the glass should be laid on a putty foundation, then held in place with wooden strips. The bedding of putty prevents rain creeping to the inside of the shed, etc.

WINDOW panes fixed in their apertures in the manner previously explained should not have their fixing strips cut into mitres at the corners—unless, that is, the windows are extremely long and wide. Butt-joined corners are the best, for the slips are then easier to prise up when a new pane has to be fitted. Mitred slips give rise to trouble owing to the difficulty of prising them up at the corners where fixing nails may be driven in; mitred slips need to be bent almost into an “arch” in order to remove them, so that the longer the slips, the easier it is to bend them.

BEFORE applying putty to new window frames, the latter should be given a coat of paint. Putty grips more strongly on a painted surface than a new, bare wooden surface.

IT is not generally known that putty can be obtained in a variety of colours. No professional glazier would, for instance, think of glazing a mahogany polished door frame, such as a bureau-bookcase door, with white putty. He prefers to use mahogany-coloured stuff which matches the interior finish of the door.

This saves having to “darken” the putty later on, when dry.

WHEN measuring a window frame for a pane of glass, never state the exact size required. Always allow 1/16in. of freedom in the length and width for fitting purposes—and tell the glass-cutter that allowance has been made. About 1/16in. shorter all round is the safest plan, for some window frames are never quite square. This means that an 18in. by 12in. window aperture calls for a pane measuring 17 7/8ins. by 11 7/8ins.



HINTS & TIPS WORTH KNOWING



A GOOD way of fitting rubber tyres to model aeroplane wheels is to get suitable lengths of rubber-covered wire cable which encircle a groove made in the circumference of the wooden discs. The copper wires are withdrawn and a new piece of thick wire inserted to hold the rubber-cover ends together, having (meanwhile) applied rubber solution to the ends. When dry, the “tyres” can be slipped on. Another and stronger method is to “splice” the rubber ends together, that is to say, cut a sloping bevel at each end so one bevel will close upon the other when the rubber is bent into a ring; the join (cemented with rubber solution) is then bound with thread and left aside to thoroughly set.

A HALF-PENNY is a very useful thing. Apart from being a coin of the realm, it makes a handy screw-driver and remover, especially in regard to large flathead and round-head screws and slotted bolts. It is also a handy lever for prising the lids off paint cans and syrup tins.

When in doubt, or undecided in some matter, the tossing of a half-penny helps to make up our minds. “Heads I go, tails I don’t go,” we say, or it might be, “Heads you win, tails I lose.” Our fate depends on the half-penny being tossed and, if we lose, we do so in a sporting manner.

Plain glass, for house windows, by the way, is never more than 15oz. stuff.

IF window frame apertures are shaped like diamonds, or rounded at the top or in various curves, such as we see, in china cabinets and bookcase doors, it is advisable to take the actual door to the glazier. He can more readily fit in the glass without the need for templates or patterns giving the shape. In fact, it would be as well to let him do the glazing, too.

SHOULD the rough side, or the smooth side, of fancy window glass be kept to the outside? The answer is that it is the rough side—on which the design pattern is embossed—that should go (or show) at the outside of a frame.

Another thing about a half-penny is its size. It measures exactly 1in. across. Two half-pennies placed side by side equal 2ins., three side by side is 3ins. and so on. A half-penny also serves as a small weight, being about 1oz. Then there is the thickness of a half-penny. Four of them, held together, one on top of the other, measure 1/4in., particularly half-pennies of 1938 vintage.

Moreover, one can play games with a half-penny, such as in the “Shove h’penny board” game. Another game is to allow a half-penny to roll down a small slope until it falls over on a winning spot on the ground. Undoubtedly, a half-penny is a very useful coin!

IN soldering, the iron must be heated until a green flame is seen, filed clean, dipped in flux, then the end applied to a stick of solder to take up a coating on the point. Do not overheat the iron when reheating it; remove it from the stove at the first suspicion of white smoke coming off. Paint the joint with flux.

VICTORY “V” STAMP FREE

We will send you **ABSOLUTELY FREE** an extremely interesting “V for Victory” Stamp that has recently been issued by the **UNITED STATES OF AMERICA**. It shows the American Eagle with outstretched wings in the form of a V, for Victory, and has the inscription **WIN THE WAR**. In addition, we will also send you another pictorial War Stamp, which was issued in 1940 also by the **U.S.A.**, for Liberty and Freedom.

These historic War Stamps are difficult to obtain in this country, but should be in every collection. They will add value and topical interest to your collection; can be looked back at as War Souvenirs when Peace comes (which we hope will be soon); while **YOU** can get them now **ABSOLUTELY FREE** from us.

To get them you must (1) write clearly your name and full address; (2) ask for Free “V” Packet; (3) Ask to see Approvals and Lists; (4) enclose 3d. in stamps to cover post and (5) post your application to:—

WINDSOR STAMP CO. (Dept. 12), UCKFIELD SUSSEX

There's something novel as well as interesting in MAKING A CROSS-BOW

DURING the 15th century, soldiers known as bowmen went forth into war with bows and arrows. This type of weapon lasted for about 300 or 400 years, and occupied a principal place with the foot soldiers of those times just as the rifle does today.

The long bow was about 5 feet long and the arrow or "cloth-yard shaft" about 3 feet long. When drawn back to the right ear, the long bow could propel the arrow a surprising distance.

From the long bow, the cross-bow was evolved, and consisted of a somewhat more sturdy hand piece mounted at the far-end of which was a cross piece upon which the propelling power was fixed. It was "fixed" somewhat like the present day rifle.

It is from this more or less primitive type of bow that our model is taken, and we believe many of our workers

now properly known as the "bolt" to rest in previous to being shot away.

A cross-section of the stock taken on the line A, A in Fig. 1 is shown in Fig. 2 and it will be seen that the channel is but shallow, and it can be made with a gouge or even a rat-tail file finished afterwards with coarse and fine glasspaper.

The Cross Arm

At, or near, the "muzzle" end of the stock a slot must be cut about 1 in. or so long by about $\frac{3}{8}$ in. wide to take the cross arm as shown in the plan Fig. 3. The cross arm should be of good sound wood and tapered towards the ends as shown.

For the trigger mechanism we shall need to cut a slot vertically through the stock about $\frac{3}{8}$ in. or rather more wide and long enough to take the trigger itself and a wire spring.

In the enlarged sectional detail Fig. 4 the slot is shown and the

Wrap the ends of the cross bar with a piece of leather or two or three thicknesses of cloth, then lay the elastic ends on these and bind with waxed cord or string or, for preference copper or brass wire.

The length of the elastic to be allowed must be gauged more or less by trial, by holding it in place on the trigger and stretching it until the desired force or pull is got.

The Bolt

For the bolt a length of $\frac{3}{8}$ in. round rod is used from 6 ins. to 8 ins. long and at one end a wire nail should be driven and the head of this filed off and the stem then pointed up see Fig. 5.

The "feathers" may be formed by first making a saw-cut and then gluing in a piece of thin shaped celluloid. The projecting end beyond the feather could be bound with glued twine or thin copper or brass

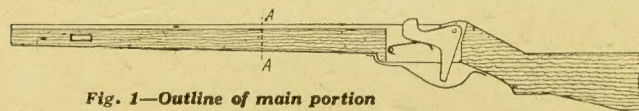


Fig. 1—Outline of main portion

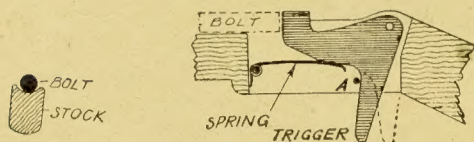


Fig. 3—End view Fig. 4—Detail of trigger mechanism

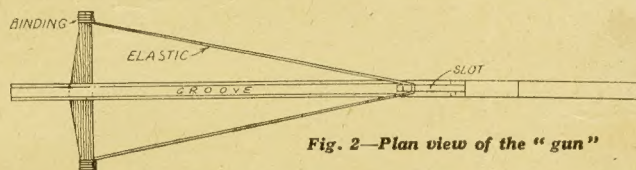


Fig. 2—Plan view of the "gun"

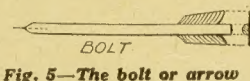


Fig. 5—The bolt or arrow

will want to make one and practise a little out-door shooting.

The Main Portion

The main part of the weapon is called the stick, and resembles somewhat in shape the ordinary rifle. A good straight-grained piece of beech or deal about an inch thick will be required, and it must be cut to the outline shown in Fig. 1.

For some distance along the top of the piece after it has been cut out and glasspapered up smooth, a groove must be cut or worked for the arrow,

trigger and spring in place. The former may be of $\frac{3}{8}$ in. hard wood such as oak or beech and it is held by a stout screw run through the stock from side to side. Take care to get the pivoting screw in such a position that it is directly in line with the pull of the elastic, which latter material is used for the propelling of the arrow.

A simple spring arrangement is devised for returning the trigger to its former position and a screw should run through the stock at A Fig. 4 as a stop.

wire. We would in conclusion speak a word of warning to the users of this war-like little weapon.

Do not aim your bow at your neighbour or your companions, nor even at your neighbour's cat because the driving force is pretty considerable and a "stray" missile may cause great and serious trouble.

It would be better to have if possible a miniature shooting range complete with circular target. Great fun and good practise in the art of shooting could be got by making one of these cross-bows.

Electric Candle—(Continued from page 45)

a screw hole is bored in the centre of disc E. A $\frac{1}{2}$ in. hole is bored near the side of the ring F to allow the side wire to go through. Having done that, unscrew the bottom screw from the candle carefully, bring the side wire through the hole provided, then fix down the candle by using a longer central screw.

The clip shown at Fig. 3 is cut from thin brass, copper, etc. It is screwed to base disc B, as shown, but before driving the screw home tight, the side wire is looped beneath the clip. The wire will, naturally, need to be

cut to a suitable length for this purpose.

Have the clip pivoted so that it does not interfere with the entry and removal of the battery. Note how the end is bent so that it is pressed against the zinc bottom of the cell. The pressure of the clip should be strong enough to push the battery contact nipple against the central candle screw and thus complete the electrical circuit for the bulb contacts.

It will be seen that the side wire screw in the candle also acts as a "grip" for the bulb threads. The

point of this screw, in other words, engages with the bulb threads, thereby enabling the bulb to be screwed in and out.

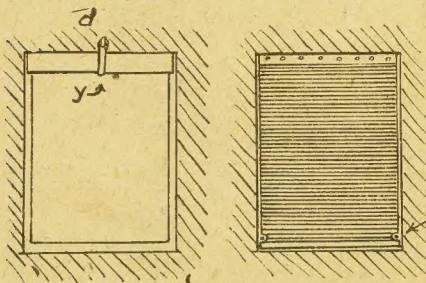
Having tested the light and found, it in working order, the novelty is enamelled in the colours already mentioned.

It is advisable always to apply two thin coats alternatively, rather than one single, thick coat. When dry, three discs of green baize (the size of a sixpence) could be adhered to the underside of the base, keeping them equidistant apart.

Quite easy to make and operate these details for A SIMPLE BLACK-OUT BLIND

HERE is an excellent method of making a quick black-out blind for the small windows in sheds, pantries, etc.

Required is a quantity of that pliable corrugated card. This can still be bought, and can sometimes



Picture of the blind rolled and lowered

be obtained in considerable lengths from wireless and other shops. The card used for these blinds must, of course, be perfect.

To make a blind cut a rectangle of the card large enough to cover the glass and the frame at both sides.

That is, the length and width must be measured from the outer edges of the wood as (A). This is important as it is the overlap on the frame that makes the blind light-tight and it is worth going to some trouble to get a really good fit. Care must be taken also when cutting the card not to flatten the corrugations.

Secure the top edge of the prepared rectangle of card to the upper part of the frame using a close series of drawing pins, for the purpose and also fasten a strip of wood $\frac{1}{4}$ in. square to the bottom edge in the same way.

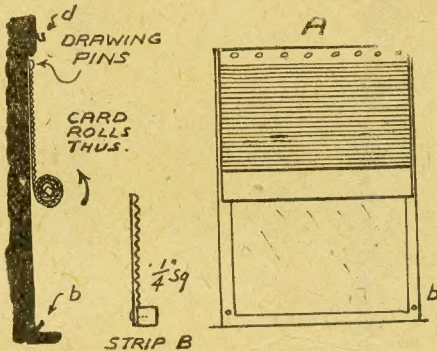
When in position (that is, the card hanging against the window) give it a slight downward stretch and drive two nails into the frame just above the strip as (b); also cut the recess as shown in the card to allow of the passage of the nail head.

The slight natural spring in the card allows of the strip (b) being caught under the nails where it

remains firm enough for all practical purposes.

For day time the blind rolls up easily on the bottom strip and is held by a loop of tape (y) which is brought round the roll and slipped over the hook (d) put in the frame just above.

The blind, it will be found is perfectly opaque and surprisingly efficient.



Side and front view details

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Printed by BALDING & MANSELL, LTD., London and Wisbech, and Published for the Proprietors, HOBBIES LTD., by HORACE MARSHALL & SON, LTD., Temple House, Tallis Street, E.C.4. Sole Agents for Australia and New Zealand: Gordon & Gotch (A'sia) Ltd. For South Africa: Central News Agency Ltd. Registered for transmission by Canadian Magazine Post.